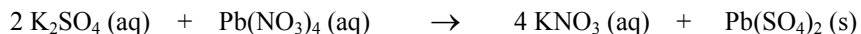


## Stoichiometry

1. Please answer the following questions for the balanced equation:

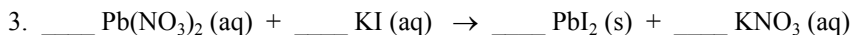


- a. If 2.25 mol of potassium sulfate reacts completely, how many mols of lead (IV) sulfate is produced?
- b. If 2.55 g of lead (IV) nitrate is reacted completely, how many grams of potassium nitrate are produced?
- c. If 1.75 g of lead (IV) sulfate is produced, how many grams of lead (IV) nitrate was reacted?

2. Please write out the reaction, balance the equation, and answer the following questions for:

a. 5.99 g of liquid ethanol ( $\text{C}_2\text{H}_6\text{O}$ ) reacts completely with oxygen gas to produce carbon dioxide and water. How many liters of carbon dioxide gas are produced at STP?

b. Solid iron is dropped into excess nitric acid to produce 7.95 L of hydrogen gas at STP and aqueous iron (III) nitrate. How many grams of iron are used?



- a. A student weighed out 23.5 g of lead (II) nitrate and mixed it with DI water. The student mixed this aqueous solution with an aqueous solution of potassium iodide. How many grams of lead (II) iodide precipitated out?
- b. If the same student ran the same reaction again and produced 16.8 g of lead (II) iodide, how much potassium iodide did the student start with?

4. An aqueous solution of sodium hydroxide is added to an aqueous solution of aluminum chloride:
- When 33.4 g of sodium hydroxide reacts with 45.9 g of aluminum chloride, how many grams of aluminum hydroxide are produced?
  - When 25.8 g of aluminum chloride is reacted with 18.9 g of sodium hydroxide, how many grams of sodium chloride are produced?
5. An aqueous solution of calcium sulfide is added to an aqueous solution of aluminum fluoride:
- When 24.9 g of calcium sulfide reacts with 22.7 g of aluminum fluoride, what is the theoretical amount of precipitate?
  - If 15.5 grams of precipitate is collected, what is the percent yield?
6. Solid aluminum metal is added to hydrobromic acid: (very dangerous reaction!)
- How many *grams* of hydrogen gas are produced when 18.7 g of aluminum reacts with 15.9 g of hydrobromic acid at STP?
  - What is the percent yield of hydrogen gas if only 2.00 L of H<sub>2</sub> is collected at STP?

**Harder:** When 36.7 g of solid magnesium metal reacts with an aqueous solution containing 40.3g of aluminum nitrate only 68.6 % of solid metal is recovered. Write a balanced equation for this reaction and calculate the mass of metal recovered.